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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,982	11/28/2001	Gyanesh P. Khare		7640

7590 05/07/2003

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EXAMINER

ARNOLD JR, JAMES

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 05/07/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/021,982

Applicant(s)

KHARE, GYANESH P.

Examiner

James Arnold, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 48-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-47, drawn to a sorbent and process of making the sorbent, classified in class 502, subclass 20.
- II. Claims 48-61, drawn to a desulfurization process, classified in class 208, subclass 208R.
- III. Claims 62-63, drawn to a desulfurization product, classified in class 208, subclass 16.

The inventions are distinct, each from the other because of the following reasons:

Inventions of Group I and Group II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different functions as the invention of Group I relates to a sorbent and a process of producing the sorbent but does not claim a method of using it and Group II relates to a desulfurization process.

Inventions of Group I and Group III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different functions as the invention of Group I relates to a sorbent and the process of making the sorbent but does not claim a method of using it and Group III relates to the product of a desulfurization process.

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Inventions of Group II and Group III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a materially different process such as hydrodesulfurization.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Lynda Jolly on April 17, 2003 a provisional election was made WITH traverse to prosecute the invention of Group I, claims 1-47. Affirmation of this election must be made by applicant in replying to this Office action. Claims 48-63 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 1,2, 5-8, 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Sughrue et al. (USPN 6,254,766).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The Sughrue reference discloses a sorbent composition comprising a support, a promoter, and a silicate. See Abstract. The reference discloses zinc oxide, silica, and alumina as components of the support. See Abstract and Column 4, lines 45-67. The reference discloses a reduced valence promoter, namely nickel, with a valence of zero and comprising at least 10 weight percent of the sorbent composition. See Column 6, lines 1-23. The reference discloses sodium silicate as a component of the sorbent composition. See Column 4, line 39.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3,4,9, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sughrue et al.(USPN 6,254,766) in view of Kinoshita et al. (USPN 6,068,824).

The Sughrue reference discloses a sorbent composition wherein said sorbent composition comprises zinc oxide in amount in a range of from about 10 to about 90 weight percent, silica in an amount in the range of from 5 to about 85 weight percent, alumina in an amount of from about 5 about 30 weight percent, a reduced valence nickel in amount of from about 5 to about 50 weight percent and a sodium silicate in amount of from about 5 to about 85 percent. See Column 4, lines 18-67. The reference discloses a sorbent composition having a particle size in the range of about 20 to about 1000 micrometers. See Column 8, lines 1-5.

The Sughrue reference does not disclose a sorbent composition wherein the promoter comprises a metal selected from the group consisting of nickel, cobalt, iron, manganese, copper, zinc, molybdenum, tungsten, silver, tin, vanadium, antimony, and combinations thereof. The reference does not disclose a composition wherein silicate includes a metal component selected from the group consisting of potassium, zirconium, aluminum, barium, beryllium, calcium, iron, magnesium, manganese, and combinations thereof. The reference does not disclose the full range of weight percent for alumina from about 1 to about 30 weight percent, the full range of

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weight percent for reduced-valence nickel in an amount in the range of from about 0.5 to about 0 weight percent, or the full range of weight percent for sodium silicate from about 1 to about 40 weight percent. The reference does not disclose the full range of sorbent composition particle size from about 1 micrometer to about 500 micrometers. The reference does not disclose a sorbent composition with a Davison Index of less than 20 percent.

The Kinoshita reference discloses a promoter comprising a metal selected from the group consisting of manganese, iron, cobalt, nickel, copper and zinc. See Column 2, lines 30-35.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the composition of Sughrue to include a promoter consisting of manganese, iron, cobalt, nickel, copper, and zinc as disclosed by Kinoshita and to further include tungsten, silver, tin, vanadium, antimony, and combinations thereof because all of the metals are heavy metals and would play a similar role in a sorbent composition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a sorbent composition wherein the silicate includes a metal component selected from the group consisting of potassium, zirconium, aluminum, barium, beryllium, calcium, iron, magnesium, manganese, and combinations thereof because silicates consist of metals and therefore the metallic elements mentioned would be expected to be an effective component of the silicate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the full range of weight percent for alumina from about 1 to about 30 weight percent, the full range of weight percent for reduced-valence nickel in an amount in the range of from about 0.5 to about 0 weight percent, or the full range of weight percent for sodium silicate from about 1 to about 40 weight percent because these ranges overlap with the ranges disclosed

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in the Sughrue reference and it would be appropriate to extend the ranges to optimize an effective sorbent composition and because the Kinoshita reference discloses that the shape of the sorbent is not particularly limited. See Kinoshita Column 7, line 18. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the full range of sorbent composition particle size from about 1 micrometer to about 500 micrometers because this range overlaps with the range disclosed in the Sughrue reference and because the Kinoshita reference discloses that the shape of the sorbent is not particularly limited. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a sorbent composition with a Davison Index of less than 20 percent because the Kinoshita reference discloses that the shape of the sorbent is not particularly limited and therefore the weight percent of the over 20 micrometer particles, as measured by the Davison Index, will vary while still allowing for an effective sorbent composition.

Claims 14-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sughrue et al. (USPN 6,254,766).

The Sughrue reference discloses a process of making a sorbent composition comprising admixing a first support component and a second support component to form a support mix; particulating said support mix to thereby provide a support particulate; contacting said support particulate with a promoter to thereby provide a promoted particulate comprising an unreduced promoter; and reducing said promoted particulate to thereby provide a reduced particulate comprising a reduced-valence promoter. Column 5, lines 1-67 and Column 6, lines 1-21. The reference discloses a process wherein the silicate includes sodium as a metal component. Column 4, lines 40. The reference discloses a process wherein the promoter is selected from the



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group consisting of metals, metal oxides, and combinations thereof including nickel. See Column 5, lines 39-48. The reference discloses a process wherein the first support component comprises zinc oxide. See Column 5, lines 39-48. The reference discloses a process wherein the reduced-valence promoter has a valence which is less than the valence of said unreduced promoter (less than 2 or zero) and the promoter is nickel. Column 5, lines 40-50. The reference discloses a process wherein the support mix comprises zinc oxide, silica, and alumina. Column 5, lines 40-50. The reference discloses a process wherein the support mix is in the form of a slurry wherein the slurry is particulated by spray-drying, wherein said support particulate is in the form of a microsphere having a mean particle size in the range of from about 20 micrometer to about 500 micrometer. Column 5, lines 14-33. The reference discloses a process wherein the sorbent composition comprises zinc oxide in an amount in the range of from about 10 to about 90 weight percent, silica in an amount in the range of from about 5 to about 85 weight percent, alumina in an amount in the range of from about 5 to about 30 weight percent, reduced-valence nickel in an amount in the range of from about 5 to about 50 weight percent. Column 13, lines 35-65. The reference discloses a process wherein the support particulate is dried and calcined prior to contacting with said promoter, and wherein said promoted particulate is dried and calcined prior to reduction. Column 14, lines 15-45.

The reference does not disclose a process of making a sorbent composition wherein a silicate is incorporated with a silicate-enhanced component selected from a group consisting of a support mix, support particulate, promoted particulate, and combinations thereof. The reference does not disclose a process wherein the silicate includes a metal component selected from the group consisting of potassium, zirconium, aluminum, barium, beryllium, calcium, iron,

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magnesium, manganese, and combinations thereof. The reference does not disclose a process wherein the silicate is incorporated with the support mix by physically mixing the silicate and said support; wherein the silicate is incorporated with the support particulate by impregnating the support particulate with the silicate; and wherein the silicate is incorporated with the promoted particulate by impregnating the promoted particulate with the silicate. The reference does not disclose the full range of support particulate microsphere from 1 micrometer to 500 micrometers. The reference does not disclose the full range of weight percent for alumina from 1 to about 30 and for nickel from about 0.5 to about 50 weight percent nor does it disclose a weight percent of sodium silicate from about 1 to about 40 weight percent. The reference does not disclose a process wherein silicate is incorporated with said support mix by physically mixing sodium silicate, zinc oxide, silica, and alumina; wherein silicate is incorporated with said support particulate by spray-impregnating said support particulate with sodium silicate; and wherein silicate is incorporated with said promoted particulate by spray-impregnating said promoted particulate with sodium silicate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process of making a sorbent composition wherein a silicate is incorporated with a silicate-enhanced component selected from a group consisting of a support mix, support particulate, promoted particulate, and combinations thereof because the reference discloses that any suitable type of silica may be employed in the sorbent composition. See Column 4, lines 33-35. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the silicate includes a metal component selected from the group consisting of potassium, zirconium, aluminum, barium, beryllium,

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calcium, iron, magnesium, manganese, and combinations thereof because silicates generally consist of metals and the metallic elements listed would be expected to be effective components of the silicates. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the silicate is incorporated with the support mix by physically mixing the silicate and said support; wherein the silicate is incorporated with the support particulate by impregnating the support particulate with the silicate; and wherein the silicate is incorporated with the promoted particulate by impregnating the promoted particulate with the silicate because the reference discloses that any suitable type of silica may be employed in the sorbent composition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the full range of support particulate microsphere from 1 micrometer to 500 micrometers is utilized because an overlapping range is disclosed by the reference and it would be appropriate to extend the range to provide for an effective support particulate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize disclose the full range of weight percent for alumina from 1 to about 30 and for nickel from about 0.5 to about 50 weight percent because overlapping ranges are disclosed by the reference and it would be appropriate to extend the ranges to provide for an effective sorbent composition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a weight percent of sodium silicate from about 1 to about 40 weight percent because the reference discloses sodium silicate as an acceptable type of silicate for a sorbent composition and it discloses a silica weight percent range of from about 20 to about 60 percent which overlaps with the claimed range. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize

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a process wherein silicate is incorporated with said support mix by physically mixing sodium silicate, zinc oxide, silica, and alumina; wherein silicate is incorporated with said support particulate by spray-impregnating said support particulate with sodium silicate; and wherein silicate is incorporated with said promoted particulate by spray-impregnating said promoted particulate with sodium silicate because the reference discloses sodium silicate as an acceptable type of silicate for a sorbent composition.

Claims 46-47 are rejected under 35 U.S.C. 102(e) as anticipated by Sughrue et al. (USPN 6,254,766) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sughrue et al. (USPN 6,254,766).

The Sughrue reference discloses a sorbent composition comprising a support, a promoter, and a silicate wherein zinc oxide, silica, and alumina are components of the support and nickel is used as a reduced valence promoter. See Abstract; Column 4, lines 45-67; and Column 6, lines 1-23.

In the event any differences can be shown for the product of the product-by-process claims 46-47, as opposed to the product taught by the Sughrue reference, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results; See *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Khare et al. (USPN 5,914,292). The Khare reference discloses a sorbent material and the process of making the sorbent.

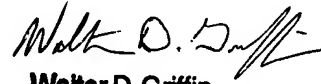
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Arnold, Jr. whose telephone number is 703-305-5308. The examiner can normally be reached on Monday-Thursday 8:30 AM-6:00 PM; Fridays from 8:30 AM-5:00 PM with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

ja  
May 5, 2003

  
**Walter D. Griffin**  
**Primary Examiner**